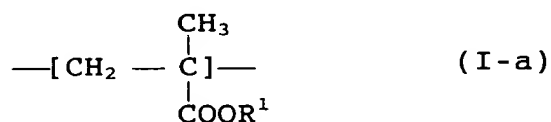


## CLAIMS

1. A surface-protected plastic composite material comprising a transparent plastic, a coating layer (I) as  
 5 a first layer stacked on the transparent plastic substrate and a thermally cured coating layer (II) as a second layer stacked on the first layer, the coating layer (I) being formed of a resin composition containing  
 10 thereof, of an acrylic resin which is an acrylic resin containing at least 50 mol% of recurring unit of the following formula (I-a),



15

wherein  $\text{R}^1$  is an alkyl group having 1 to 4 carbon atoms,

the thermally cured coating layer (II) being made of an organosiloxane resin formed from the following  
 20 components a, b and c,

(A) colloidal silica (component a),

(B) a hydrolysis condensate (component b) of a trialkoxysilane of the following formula (II-1),



25 wherein  $\text{R}^2$  is an alkyl group having 1 to 4 carbon atoms, a vinyl group or an alkyl group which has 1 to 3 carbon atoms and is substituted with at least one group selected from the group consisting of methacryloxy, amino, glycidoxy and 3,4-epoxycyclohexyl and  $\text{R}^3$  is an  
 30 alkyl group having 1 to 4 carbon atoms, and

(C) a hydrolysis condensate (component c) of a tetraalkoxysilane of the following formula (II-2),



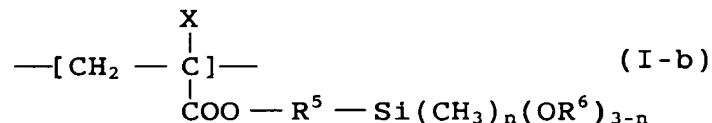
wherein  $\text{R}^4$  is an alkyl group having 1 to 4 carbon

atoms, the organosiloxane resin containing 5 to 45 % by weight of the component a, 50 to 80 % by weight, as  $R^2SiO_{3/2}$ , of the component b and 2 to 30 % by weight, as  $SiO_2$ , of the component c.

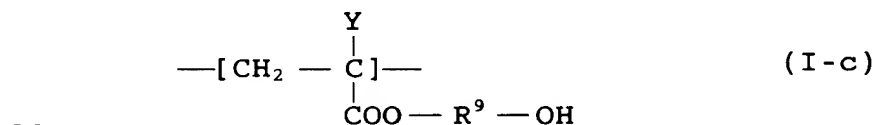
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2. The transparent plastic composite material of claim 1, wherein the acrylic resin of the coating layer (I) is an acrylic copolymer resin having recurring units of the said formula (I-a) and the following formula (I-b)

10 and/or the following formula (I-c),



in which X is a hydrogen atom or methyl,  $R^5$  is an alkylene group having 2 to 5 carbon atoms,  $R^6$  is an alkyl group having 1 to 4 carbon atoms and n is an integer of 0 or 1,



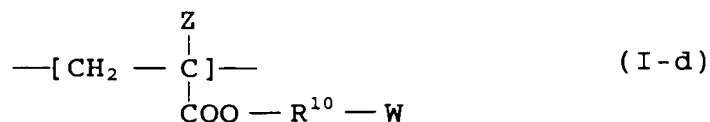
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in which Y is a hydrogen atom or methyl and  $R^9$  is an alkylene group having 2 to 5 carbon atoms,

and further wherein the acrylic copolymer resin has a (I-a):[(I-b) + (I-c)] molar ratio of the units in the range of from 99.5:0.5 to 50:50.

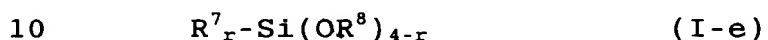
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3. The transparent plastic composite material of claim 2, wherein the acrylic copolymer resin is an acrylic copolymer resin containing 0.3 to 40 mol%, based on the total units of the above formulae (I-a) and [(I-b) + (I-c)], of units of the following formula (I-d),



wherein Z is a hydrogen atom or methyl,  $R^{10}$  is an alkylene group having 2 to 5 carbon atoms and W is an ultraviolet absorbent residue.

- 5 4. The transparent plastic composite material of any one of claims 1 to 3, wherein the coating layer (I) is formed of a mixture of the acrylic resin with a hydrolysis condensate of a compound of the following formula (I-e),



wherein  $R^7$  is an alkyl group having 1 to 4 carbon atoms, a vinyl group or an alkyl group which is substituted with one or more groups selected from the class consisting of methacryloxy, amino, glycidoxy and  
 15 3,4-epoxycyclohexyl and has 1 to 3 carbon atoms,  $R^8$  is an alkyl group having 1 to 4 carbon atoms, and r is an integer of 0 to 2, the mixture having an acrylic resin:hydrolysis condensate (as  $R^7_r-SiO_{4-r/2}$ ) amount ratio by weight in the range of from 99:1 to 60:40,

20

5. The transparent plastic composite material of claim 4, wherein the coating layer (I) further contains a melamine resin in the range of from 1 to 20 parts by weight per 100 parts by weight of the total of the  
 25 acrylic resin and the hydrolysis condensate of the compound of the formula (I-e).

6. The transparent plastic composite material of any one of claims 1 to 4, wherein the coating layer (I)  
 30 further contains 0.7 to 100 parts by weight, per 100 parts by weight of the acrylic resin, of an ultraviolet absorbent.

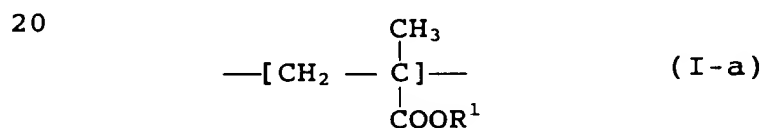
7. The transparent plastic composite material of claim

6, wherein the ultraviolet absorbent has a solubility of 1.5 g/L or less in a solvent mixture containing 100 parts by weight of isopropanol, 30 parts by weight of methanol and 15 parts by weight of water when measured at 25°C.

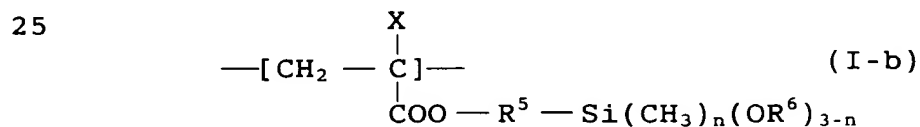
8. The transparent plastic composite material of claim 1, wherein the coating layer (II) is a thermally cured layer of a resin composition containing 15 to 35 % by weight of the component a, 55 to 75 % by weight, as  $R^2SiO_{3/2}$ , of the component b and 3 to 20 % by weight, as  $SiO_2$ , of the component c.

9. The transparent plastic composite material of claim 1, wherein:

(1) the coating layer (I) is formed of a resin composition containing an acrylic copolymer resin which is formed of recurring units of the following formulae (I-a) and (I-b),



wherein  $R^1$  is as defined in the foregoing formula (I-a),



wherein X,  $R^5$ ,  $R^6$  and n are as defined in the foregoing formula (I-b),

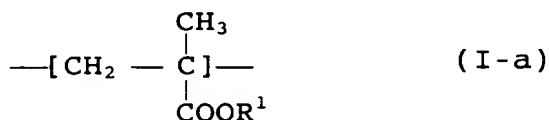
and which has a (I-a):(I-b) unit ratio in the range of from 97:3 to 70:30 and 3 to 60 parts by weight, per 100 parts by weight of the acrylic copolymer resin, of an ultraviolet absorbent, the ultraviolet absorbent having a solubility of 1.5 g/L or less in a solvent mixture

containing 100 parts by weight of isopropanol, 30 parts by weight of methanol and 15 parts by weight of water when measured at 25°C, and

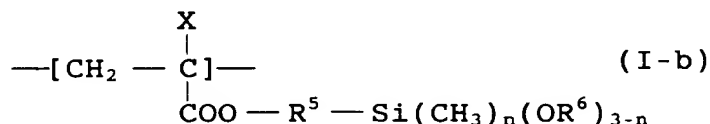
(2) the coating layer (II) is a thermally cured layer of a resin composition containing 15 to 35 % by weight of the component a, 55 to 75 % by weight, as  $R^2SiO_{3/2}$ , of the component b and 3 to 20 % by weight, as  $SiO_2$ , of the component c.

10. The transparent plastic composite material of claim 1, wherein:

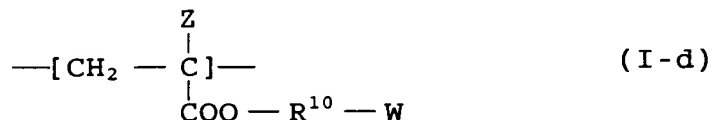
(1) the coating layer (I) is formed of a resin composition containing an acrylic copolymer resin which is formed of recurring units of the following formulae (I-a), (I-b) and (I-d),



wherein  $R^1$  is as defined in the foregoing formula (I-a),



wherein X,  $R^5$ ,  $R^6$  and n are as defined in the foregoing formula (I-b),



wherein Z,  $R^{10}$  and W are as defined in the foregoing formula (I-d),

and which has a (I-a):(I-b):(I-d) unit ratio in the range of from 96.7-60:3-30:0.3-15 and 3 to 60 parts by weight, per 100 parts by weight of the acrylic copolymer resin, of an ultraviolet absorbent, the ultraviolet

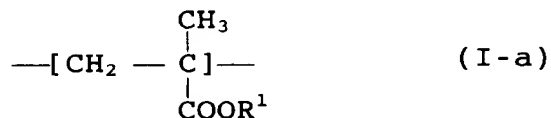
absorbent having a solubility of 1.5 g/L or less in a solvent mixture containing 100 parts by weight of isopropanol, 30 parts by weight of methanol and 15 parts by weight of water when measured at 25°C, and

- 5 (2) the coating layer (II) is a thermally cured layer of a resin composition containing 15 to 35 % by weight of the component a, 55 to 75 % by weight, as  $R^2SiO_{3/2}$ , of the component b and 3 to 20 % by weight, as  $SiO_2$ , of the component c.

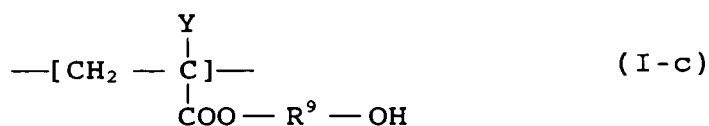
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11. The transparent plastic composite material of claim 1, wherein:

- (1) the coating layer (I) is formed of a resin composition containing 100 parts by weight of an acrylic copolymer resin which is formed of recurring units of  
15 the following formulae (I-a) and (I-c),



- 20 wherein  $R^1$  is as defined in the foregoing formula (I-a),



- 25 wherein Y and  $R^9$  are as defined in the foregoing formula (I-c),  
and which has a (I-a):(I-c) unit ratio in the range of from 95:5 to 60:40, a mixture (as  $R^7_rSiO_{4-r/2}$ ) of hydrolysis condensates of a compound of the formula (I-e),  
30 e),



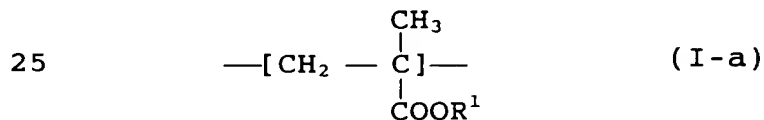
wherein  $R^7$ ,  $R^8$  and r are as defined in the foregoing formula (I-e), the mixture having such an amount that the ratio of the acrylic copolymer resin:the hydrolysis

condensates comes to be 99:1 to 60:40 by weight, a melamine resin in such an amount that the amount thereof per 100 parts by weight of the total of the acrylic copolymer resin and the hydrolysis condensates comes to be 3 to 15 parts by weight, and 3 to 60 parts by weight, per 100 parts by weight of the acrylic copolymer resin, of an ultraviolet absorbent, the ultraviolet absorbent having a solubility of 1.5 g/L or less in a solvent mixture containing 100 parts by weight of isopropanol, 30 parts by weight of methanol and 15 parts by weight of water when measured at 25°C, and

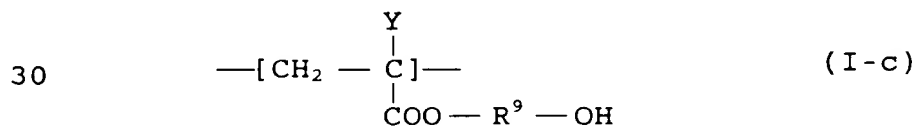
(2) the coating layer (II) is a thermally cured layer of a resin composition containing 15 to 35 % by weight of the component a, 55 to 75 % by weight, as  $R^2SiO_{3/2}$ , of the component b and 3 to 20 % by weight, as  $SiO_2$ , of the component c.

12. The transparent plastic composite material of claim 1, wherein:

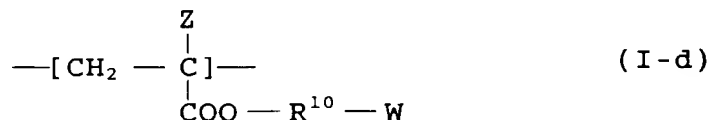
(1) the coating layer (I) is formed of a resin composition containing 100 parts by weight of an acrylic copolymer resin which is formed of recurring units of the following formulae (I-a), (I-c) and (I-d),



wherein  $R^1$  is as defined in the foregoing formula (I-a),

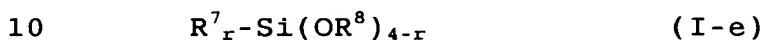


wherein Y and  $R^9$  are as defined in the foregoing formula (I-c),



wherein Z,  $\text{R}^{10}$  and W are as defined in the foregoing  
 5 formula (I-d),

and which has a (I-a):(I-c):(I-d) unit ratio in the  
 range of from 94.7-50:5-40:0.3-15, a mixture (as  $\text{R}^7_r\text{SiO}_{4-r/2}$ ) of hydrolysis condensates of a compound of the  
 formula (I-e),



wherein  $\text{R}^7$ ,  $\text{R}^8$  and r are as defined in the foregoing  
 formula (I-e), the mixture having such an amount that  
 the ratio of the acrylic copolymer resin:the hydrolysis  
 condensates comes to be 99:1 to 60:40 by weight, a  
 15 melamine resin in such an amount that the amount thereof  
 per 100 parts by weight of the total of the acrylic  
 copolymer resin and the hydrolysis condensates comes to  
 be 3 to 15 parts by weight, and 3 to 60 parts by weight,  
 per 100 parts by weight of the acrylic copolymer resin,  
 20 of an ultraviolet absorbent, the ultraviolet absorbent  
 having a solubility of 1.5 g/L or less in a solvent  
 mixture containing 100 parts by weight of isopropanol,  
 30 parts by weight of methanol and 15 parts by weight of  
 water when measured at 25°C, and

25 (2) the coating layer (II) is a thermally cured  
 layer of a resin composition containing 15 to 35 % by  
 weight of the component a, 55 to 75 % by weight, as  
 $\text{R}^2\text{SiO}_{3/2}$ , of the component b and 3 to 20 % by weight, as  
 $\text{SiO}_2$ , of the component c.

30

13. The transparent plastic composite material of claim  
 1, wherein the transparent plastic substrate is made of  
 an aromatic polycarbonate resin.



14. The transparent plastic composite material of claim 1, which has a thickness in the range of from 0.001 to 10 mm.

5 15. The transparent plastic composite material of claim 1, wherein, when subjected to a 1,000-rotation Taber abrasion test (ASTM D1044) using a CS-10F abrasion wheel supplied by Calibrase under a load of 500 g, the transparent plastic composite material shows a change of  
10 2 % or less between its haze values before and after the test.

16. The transparent plastic composite material of claim 1, which substantially does not show any occurrence of  
15 cracking on the surface thereof after maintained in boiling water for 3 hours.

17. An organic window glass made of the transparent plastic composite material recited in claim 1.

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18. An organic window glass for a car or an aircraft, which is made of the transparent plastic composite material recited in claim 1.